GOLDSTEIN'S *NOMINA NUDA* OF CATENICELLIDAE (BRYOZOA).

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(Plate XVIII.)

The collection of J. R. Y. Goldstein, an early worker on the Recent Bryozoa of Victoria, was recently discovered at the premises of the Royal Society of Victoria and has since been presented in part to the National Museum. The bulk of the collection consists of Recent Bryozoa, including European species obtained from A. W. Waters by exchange, portion of the material described by Goldstein from the Marion Islands (1882) and bulk material from Port Denison and Holborn Island (Queensland), the faunules of which were described by Haswell (1880).

Of more particular interest to the author was the discovery of balsam mounts partly supplying the key to Goldstein's *nomina nuda* of Catenicellidae published in Jelly's catalogue (1889); these form the subject of this contribution. Enquiries made by Sir Sidney F. Harmer for the author at the British Museum (Nat. Hist.) and at the Manchester Museum, have added considerable information to the subject, and my acknowledgments are due to him and to Miss Hastings, Ph.D. (Brit. Mus.) and Miss Legge (Manchester Mus.).

The material here considered was collected in the Bass Strait region; no exact localities are indicated on the original labels, but the specimens probably come from the Bracebridge Wilson dredgings taken at Port Phillip Heads.

The following inferences have been drawn, from the facts now come to light, regarding the reason for the publication of the *nomina nuda* and the previous history of these names. The series of balsam mounts, including previously described species and Goldstein's MS. species, appear to have been prepared at the one time since the balsam is baked to the same colour and similar labels, with the inscriptions written in lead pencil, are used in all cases. Of the previously-described forms, *"Catenicella" wilsoni* Macgillivray, 1880, is the latest allotted a name in the series of slides, thus fixing the earliest

limit of the erection of these names. On the evidence of *"Catenicella" constricta* Goldstein MS., which was described by Macgillivray (1884) as *"Catenicella" utriculus*, the latest limit is defined.

A bound series of "jellygraph" copies of drawings by Busk in the British Museum (Nat. Hist.), bearing the inscription in Busk's handwriting: "These are all original figures from specimens, excepting Calpidium ornatum. Nov., 1881," contains figures of specimens of the *nomina nuda* in question and therefore these specimens must have been examined by Busk prior to this date. A copy of this MS. work of Busk, obtained on loan through Sir Sidney F. Harmer from the British Museum, showed that there is nothing in the explanation of the figures to indicate that Goldstein's forms were MS. species and, since Miss Jelly is known to have possessed a copy of this work, it is presumed that she regarded them as having been described, but not knowing where they were described, she included them in the catalogue for the sake of completeness. The placing of two of Macgillivray's species described in 1887 in the synonymy of Goldstein's MS. species is also thus explained.

Goldstein apparently confused the application of his MS. names, for some of them are applied to different forms. From Busk's "jellygraphs," drawings made by Sir Sidney F. Harmer of slides in the Manchester Museum (Waters and Jelly Collections) and the series of slides under consideration, the following correlation is made:

Catenicella constricta = *Vittaticella utriculus* (Macgillivray, 1884) in present series (Nat. Mus. Coll., No. 69247).

Catenicella inflata = *Vittaticella elegans robusta* var. nov. in present series (Nat. Mus. Coll., No. 69248).

Catenicella maccoyi = ? *Scuticella margaritacea* (Busk, 1852) in Busk's "jellygraphs" (p. 7); a slide labelled thus is described by Bale (1922) as *Claviporella goldsteini* sp. nov. (= *Claviporella imperforata* Macgillivray, 1887).

Catenicella monstrosa = *Scuticella subventricosa* sp. nov. in present series (Nat. Mus. Coll., No. 69249) and in the Jelly Collection (Manchester Museum).

Catenicella perplexa = *Scuticella margaritacea* (Busk, 1852) in Busk's "jellygraphs" (p. 4).

Claviporella bicorne = *Claviporella imperforata* Macgillivray, 1887, in Busk's "jellygraphs" (p. 1, as *Catenicella (Calpidium) bicornis* Goldst.).

Claviporella cacatua = *Claviporella imperforata* Macgillivray, 1887, in present series (as *Catenicellopsis cacatua*, Nat. Mus. Coll., No. 69250); in Busk's "jellygraphs" (p. 1, as *Calpidium saccatum* Goldstein in explanation of figures and *Catenicellopsis (Calpidium) cacatua* Goldst. written on figure); in the Waters Collection (Manchester Museum), No. H 1186 as *Catenicella cacatua* Goldst. The specimen labelled *Claviporella cacatua* in the Jelly Collection (Manchester Museum) appears to be *Claviporella pulchra* Macgillivray, 1887.

In addition to these, the following two unpublished MS. names occur in the series of slides under consideration: *Catenicella oculata* Goldst. MS. = *Scuticella urnula* (Macgillivray, 1887) (Nat. Mus. Coll., No. 69251); *Catenicella pyriformis* Goldst. MS. = *Vittaticella castanea* (Thomson, 1858) (Nat. Mus. Coll., No. 69252).

Family **CATENICELLIDAE** Busk, 1852.

Subfamily **Vittaticellinae** Stach, 1933.

Genus VITTATICELLA Maplestone, 1901.

Vittaticella elegans robusta var. nov.

(Pl. XVIII, figs. 1, 2, 3.)

Catenicella elegans (*pars*) Busk, 1852, p. 10, pl. ix, figs. 1,2.

Catenicella inflata Goldstein MS., Jelly, 1889, p. 37 (*nomen nudum*).

Vittaticella elegans (Busk), Waters, 1913, p. 484, pl. lxv, figs. 1-7, 12.

Dimensions.—Zooecium: length, 0·55 mm., width, 0·30; aperture: diameter, 0·09.

Observations.—This form, which was first figured by Busk from South Africa, differs from the typical *V. elegans* (Busk, 1852) from Bass Strait in that the vittae extend nearly to the level of the proximal rim of the aperture and the general dimensions are greater. The avicularia tend to be more robust and are often greatly developed on one side of the zooecium.

Vittaticella castanea (Thomson).
(Pl. XVIII, figs. 4, 5, 6, 7.)

Catenicella castanea Thomson, 1858, p. 138, pl. xiii, fig. 3.

Catenicella pyriformis Goldstein MS.

Description.—Zooecium elongate-ovate in outline; greatest width, at middle level of zooecium, equals about half length of zooecium. The slightly concave proximal rim is situated in the middle third of the zooecium one-third of the distance from distal to proximal connecting-tube apertures. Height of aperture equals about half the distance from the proximal rim to the distal connecting-tube aperture.

The triangular scapular compartments, at level of aperture, project laterally. The suprascapular compartments, small in extent, face obliquely laterally. The vittae, facing directly laterally, extend from slightly below level of proximal rim to distal connecting-tube aperture and communicate by a single row of nine to eleven septula.

Axis of daughter zooecium inclined at about 35° to that of mother zooecium. The sub-circular ovicell, barely projecting above frontal of distal zooecium, has a crenate margin formed by ten to twelve depressions.

Dimensions.—Zooecium: length, 0·57 mm., width, 0·27; aperture: diameter, 0·09; ovicell: height, 0·23.

Observations.—The ovicell of this species is figured for the first time and proves to be of similar type to those of other species of *Vittaticella*. Thomson's figure, which illustrates the appearance of the vittae as seen in transparent balsam preparations, suggests that the vittae are forwardly directed. Goldstein's mounts show a similar appearance, but the vittae are clearly laterally-directed.

This species is characterized by the length of the vittae and the projecting triangular scapular compartments.

Vittaticella utriculus (Macgillivray).
(Pl. XVIII, figs. 12, 13.)

Catenicella utriculus Macgillivray, 1884, p. 32, pl. lxxxix, fig. 5.

Catenicella constricta Goldstein MS., Jelly, 1889, p. 35.

Description.—Zooecium broadly ovate with triangular latero-distal projections; greatest width, at upper level of scapular compartments, is less than length of zooecium. The slightly concave proximal rim is situated in the middle quarter of the zooecium one-fifth of the distance between distal and proximal connecting-tube apertures. Height of aperture equals about two-thirds of the distance from the proximal rim to the distal connecting-tube aperture.

The triangular scapular compartments, at and above level of aperture, appear as prominent latero-distal processes. The suprascapular compartments, of small extent, are directed upward. The vittae, facing directly laterally, extend from slightly below level of proximal rim to distal connecting-tube aperture.

Axis of daughter zooecium inclined at about 45° to that of mother zooecium. Ovicell unknown.

Dimensions.—Zooecium: length, 0·66 mm., width, 0·42; aperture: diameter, 0·10.

Observations.—This species is characterized by its rotund zooecia and the conspicuous constriction between the distal termination of the vittae and the scapular compartments.

Sub-family **Scuticellinae** Stach, 1934.

Genus SCUTICELLA Levinsen, 1909.

Scuticella subventricosa sp. nov.
(Pl. XVIII, figs. 8, 9, 10, 11.)

Catenicella monstrosa Goldstein MS., Jelly, 1889, p. 38 (*nomen nudum*).

Description.—Zooecium semi-elliptical in outline, the suprascapular compartments extending distally beyond level of distal connecting-tube aperture; greatest width, at level of scapular compartments, equals about two-thirds length of zooecium.

The slightly convex proximal rim, with median shallow sinus, is situated in the middle third of the zooecium about one-third of the distance proximally from the distal connecting-tube aperture. Height of aperture equals three-quarters of the distance from the proximal rim to the distal connecting-tube aperture.

The ovate sternal area has five to seven fenestrae, the most distal pair, when present, being of smaller size and occurring close to the proximal angles of the aperture.

The scapular compartments, normally at the level of the aperture, usually face directly laterally. The suprascapular compartments face upward and project distally into acute processes above the level of the distal connecting-tube aperture. The distal infrascapular compartments extend to the middle level of the zooecium, the proximal infrascapular compartments extending to the proximal connecting-tube aperture; both are laterally-directed.

Axis of daughter zooecium inclined at about 40° to that of mother zooecium.

The terminal gonoecium is oval in outline and surmounted latero-distally by a pair of laterally-directed avicularia with acute distal processes. The transversely semi-elliptical sternal area has five fenestrae. The proximal rim of the transverse aperture has a median broad shallow sinus. The supra-apertural area generally has a median and two lateral distally-placed small fenestrae, a median frontal pair and lateral large pair of proximal fenestrae. A pair of lateral compartments occurs on each side facing laterally.

Dimensions.—Holotype: Zooecium: length, 0·63 mm., width, 0·46; aperture, diameter: 0·16; gonoecium: length, 1·15, width, 0·80; aperture: width, 0·38, height, 0·20.

Variation.—Apart from the normal variation occurring in Catenicellidae (Stach, 1934) the following points are noted: The avicularia usually face laterally, but may vary greatly in size, some extending from the distal con-

necting-tube aperture to a level at about two-thirds of the distance from distal to proximal connecting-tube apertures. Forwardly-directed avicularia of small size occur rarely.

Type Material.—Holotype: Balsam mount of fragment with ovicells. Nat. Mus. Coll., No. 69249.

Affinities.—The labelling of Goldstein's slide indicates that he originally confused this form with *S. ventricosa* (Busk, 1852), from which it differs notably in the form of the gonoecium. The zooecial characteristics are the occasional abnormally large avicularia and the inconspicuous distal pair of the seven fenestrae.

Observations.—No slide labelled "monstrosa" occurs in the Goldstein series and the identification is based on camera lucida drawings, sent me by Sir Sidney F. Harmer, of a slide labelled *"Catenicella monstrosa"* from the Jelly Collection at the Manchester Museum. The label on the holotype slide bears the words "Cat. ventricosa (*ventricosa* erased) with monster avic.," and thus also supplies a clue to its identification. Harmer's notes (*in litt.*, 6-vi, 1934) on the Manchester specimen confirm the identification.

The gonoecium of this form illustrates an early stage in the evolutionary trend culminating in the modified terminal gonoecium which predominates in Scuticellinae. The terminal gonoecium appears to have been derived from the Vittaticellinid type, where the ovicell pertains to two single zooecia. The suggested developmental trend is that the endozooecial ovicell gradually became restricted to the proximal zooecium, ceasing to overlap the distal zooecium which subsequently failed to develop, thus causing the ovicelligerous zooecium to terminate a branch. In the gonoecium of this species, homologues of all the lateral compartments present in a normal zooecium are readily recognizable and there is even a suggestion of the vestige of a distal connecting-tube aperture.

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Explanation of Plate XVIII.

(Magnification: × 60.)

Fig. 1. *Vittaticella elegans robusta* var. nov. Geminate pair from Victoria. Nat. Mus. Coll., No. 69248.

Fig. 2. *V. elegans robusta*. Normal single zooecium from Victoria. Nat. Mus. Coll., No. 69248.

Fig. 3. *V. elegans robusta*. Single zooecium with large avicularium. Nat. Mus. Coll., No. 69248.

Fig. 4. *Vittaticella castanea* (Thomson, 1858). Single zooecium. Nat. Mus. Coll., No. 69252.

Fig. 5. *V. castanea*. Geminate pair. Nat. Mus. Coll., No. 69252.

Fig. 6. *V. castanea*. Lateral view of ovicelled zooecium. Nat. Mus. Coll., No. 69252.

Fig. 7. *V. castanea*. Frontal view of ovicelled zooecium. Nat. Mus. Coll., No. 69252.

Fig. 8. *Scuticella subventricosa* sp. nov. Frontal view of terminal gonoecium from Victoria. Nat. Mus. Coll., No. 69249.

Fig. 9. *S. subventricosa* sp. nov. Single zooecium with large avicularium. Nat. Mus. Coll., No. 69249.

Fig. 10. *S. subventricosa* sp. nov. Geminate pair. Nat. Mus. Coll., No. 69249.

Fig. 11. *S. subventricosa* sp. nov. Single zooecium. Nat. Mus. Coll., No. 69249.

Fig. 12. *Vittaticella utriculus* (Macgillivray, 1884). Single zooecium from Victoria. Nat. Mus. Coll., No. 69247.

Fig. 13. *V. utriculus*. Geminate pair. Nat. Mus. Coll., No. 69247.

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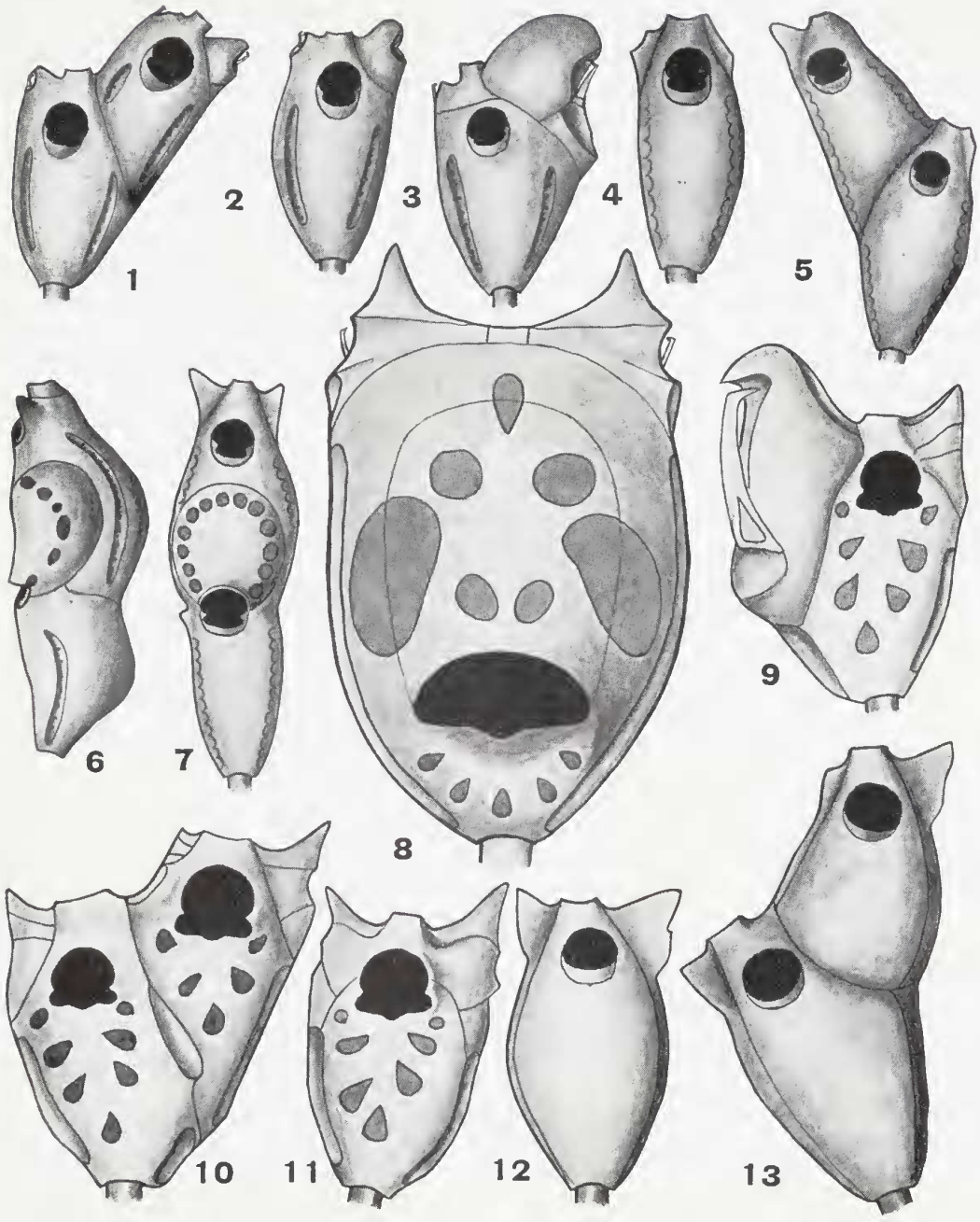

Recent Catenicellidae